

The difference in the nature of the phytoplanktonic composition between the lake and its reservoir might be responsible for the difference in the presence of these birds. The reservoir harboured the blue green-algae (Cyanophyceae) comparatively higher in percentage and dominating over other algae in the most of the observations (Table 1). The percentage of *Spirulina* spp. in the total phytoplankton was always found higher than 50% except in the month of September and the reservoir, whereas in the lake it was found mostly lower in percentage and sometimes totally absent (Table 1). The trophic relationship between *Spirulina* spp. and flamingos has also been reported by Hecky and Kilham (1973) and Melack and Kilham (1974) in the alkaline, saline lakes of East Africa (Nakura

and Elmenteita of Kenya; Reshitani and Big Momela of Tanzania).

Besides the *Spirulina* (phytoplankton), zooplankton like copepods (*Cyclops* spp.), Cladocera (*Moina* sp.), Rotifers (*Brachionus* sp.) and *Chironomus* spp. larvae were also found in abundance both in the lake and the reservoir. However, the *Chironomus* spp. on which these birds also feed (Jenkin 1957) were found many times more in the lake than in the reservoir (Alam 1980). But the absence of the flamingos in the lake might be due to the availability of *Chironomus* spp. (bottom dwellers) only in the deep water bottom.

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10. BREEDING OF BUSTARDS — AN OBSERVATION IN AUSTRALIA

In our country, the bustards in general and the Great Indian bustard in particular have been very much in the news of late, especially with falconry crossing international borders threatening the very existence of these species.

At one time the Great Indian bustard *Chorioptis nigriceps* was well distributed over the country spread over the states of Rajasthan, Gujarat, Maharashtra, Madhya Pradesh and Karnataka but is now restricted in numbers,

having been shot indiscriminately by trigger happy sportsmen.

The Indian Board for Wildlife, concerned with the species being threatened with extinction, have time & again recommended creation of sanctuaries to conserve these species and also to take up captive breeding. While the Government of Karnataka have created a sanctuary for the blackbuck and the Great Indian bustard at Ranibennur, Maharashtra & Madhya Pradesh are in the process of notifying areas for conserving & breeding the Great Indian bustard and training officials for the purpose.

While these attempts are afoot, given below are some observations made and information collected by the author on breeding the Australian bustard at the Serendip Wildlife Research Station, Victoria, Australia, while attending the National Parks & Reserves Planning & Management Course from February to May 1978, which could be considered for adoption for the breeding of the Great Indian bustard in our country.

The Australian bustard — *Ardeotis australis* is no better off than its Indian counterpart. Known as the 'Plains turkey', once a favourite game bird, this bustard has been made rare or even wiped out in places during the last two centuries. Concerned at the diminishing numbers, the Victoria Fisheries & Wildlife department finally captured & established in 1966, 24 birds in a cleverly designed complex of eight one-acre pens at Serendip. These pens are octagonal in shape (sketch enclosed) and radiate like segments of an orange with an observation tower & feeding & catching enclosure at the centre. In each pen a large male bustard is isolated, but the much smaller females can move through the whole area by means of small gates in the fence which only permits the smaller sized females to pass

through. The enclosures should have sufficient cover, e.g. high grass or low shrubs where birds can shelter from wind or human disturbance and can acclimatise themselves to the new surroundings. This would mean planting of the habitat before the desired effect was achieved. Birds are pinioned if open enclosures are used.

Breeding behaviour:

Males reach sexual maturity between 5-7 years & the first female to lay eggs was at the age of 6. Males stand & strut during display with the gular pouch being inflated and the tail reversed over the back. The display occurs between June & November in Victoria where seasonal conditions are stable. Females are quite compatible between themselves and with the males. Several females can nest in one enclosure successfully and usually lay close to the same location each year. Eggs are taken away as soon as the clutch of one or two is completed, for artificial incubation. Attempts at allowing females to hatch their own eggs have been unsuccessful.

Rearing:

1-5 days: For the first five days after hatching the young chicks are kept in a box with a number of partitioned sections of dimensions 30 cm W x 58 cm L x 27 cm H. Heating is done by clear carbon heat lamp of 240 W x 115 W, to give floor level heat of 37.5°C. The chicks are fed powdered turkey started crumbles 24% protein, fresh liver (cut in very small pieces) & meal worms (to develop pecking). Chicks are fed with tweezers 4-6 times a day. A clean feather duster is hung in the box at the warm end and the chick soon learns to shelter under it. Bustard chicks are reared in open pens, until twenty-eight days old.

On the 6th day the chicks are placed in a

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circular pen 30 cm H x 1.5 m in diameter. A thick layer of sand is used on the floor. Young chicks are sometimes aggressive & better separated by glass between pens.

After the 11th day the chicks are moved to a large indoor enclosure 1.5 m W x 3 m L x 60 cm high with sand floor. They are more compatible as they grow older, but should be watched closely when put together in a small area.

30 day old chicks are shifted to enclosures 10'W x 30'L with the first 10' covered in. Clover & lucerne are grown in the enclosures. When the chicks are four months old they are

transferred to open enclosures with plenty of trees & shrubs.

Diseases: There have been no problem with diseases as the species are very hardy. The main losses are due to fractures of the wings & legs especially when rearing wild caught chicks, due to a combination of insufficient calcium in the diet causing bone deterioration and poor management regarding handling them.

At the time of my visit, Serendip had eight adult males, six adult females twelve years & over. In addition there are seven hand reared *juveniles*, two males & five females.

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11. FEEDING HABITS OF COPPERSMITH *MEGALAIMA HAEMACEPHALA* (MULLER)

The Coppersmith, *Megalaima haemacephala* is a frugivorous bird. Recently a Coppersmith (*Megalaima haemacephala*) was caught in one of the mulberry fields in the campus of the Tamil Nadu Agricultural University, Coimbatore. The bird was kept in a cage and fed with fruits of mulberry, grapes, and *Ficus bengalensis*, thrice daily in the morning, afternoon and evening and the quantity of the fruits consumed each time was recorded. The bird was fed with mulberry for six weeks whereas *Ficus bengalensis* and grapes were restricted to one week only. The data gathered are furnished in the Table 1. The feeding studies reveal that the bird consumed 48.64

TABLE 1

| Types of Food | No. of weeks | Mean quantity of berries consumed in gms/ day | Energy* (kilo joules) |
|---------------|--------------|---|-----------------------|
| Mulberry | I | 48.64 | 100 |
| | II | 52.54 | 108 |
| | III | 66.30 | 136 |
| | IV | 75.36 | 155 |
| | V | 74.25 | 152 |
| | VI | 75.77 | 155 |
| Ficus | I | 54.06 | 163 |
| Grapes | I | 35.35 | 124 |

* Adopted from Gopalan *et al.* (1971).
1 calorie = 4.184 joule.